

Department of Chemistry

Programme Outcomes

Acquire knowledge about theoretical and practical chemistry comprising physical, organic, inorganic and analytical chemistry and to apply that fundamental knowledge for advanced learning of chemistry.

To build the strong foundation on concepts of atomic structure this includes atomic models, quantum numbers, and electron configuration.

To comprehend the periodic table organization, trends in atomic radii, ionization energy, electronegativity, and electron affinity.

To develop the concepts of stereochemistry that includes chirality, stereoisomerism, and conformational analysis of organic compounds.

Understand the basic knowledge of inductive effect, resonance effect and hyper-conjugation effect and stability of organic compounds.

The student will acquire knowledge on basic properties and behavior of gases including the ideal gas law and deviations from ideal behavior, real gas behavior using the Vander Waals equation and so on.

To understand physical properties and behavior of liquids including vapor pressure, surface tension coefficient of viscosity, temperature variation of viscosity and so on.

To develop critical thinking among the students for solving the various problems related to chemistry in everyday life.

Expose of laboratory experiments to build up a research attitude to tackle various burning issues at global and local level.

Course Outcomes

Upon successful completion of this course, students will possess a clear and thorough understanding of atomic and molecular structures, chemical bonding, periodic trends, and the behavior of gases and liquids. They will be equipped to apply this knowledge to solve complex chemical problems, conduct experiments, and engage with advanced topics in chemistry. Additionally, they will develop the critical thinking and problem-solving skills required for success in both academic and practical direction.

FYUGP NEP-2020 Semester I	
Paper Code	Discussion Topics
Chemistry-I (3L-0T-1P)	This paper is aimed at building the fundamentals knowledge of chemistry in the mindset of students with emphasis on atomic structure, periodicity, chemical bonding (ionic interaction), structure of organic molecule on the basis of hybridization, stereochemistry of organic molecule, electronic effect to explain stability of organic molecules, and physical properties and behavior of liquids and gas etc.
FYUGP NEP-2020 Semester II	
Chemistry II (3L-0T-1P)	Student shall understand and apply the concepts of chemical bonding, co-ordinations chemistry, acids and bases, and the reactive intermediates. They shall also understand the chemistry from a thermodynamic point of view. Students will acquire preliminary training on quantitative analysis, synthesis of co-ordination compounds, and qualitative analysis of organic compounds and measurement of a few basic thermodynamic parameters.
FYUGP NEP-2020 Semester III	
Chemistry II (3L-0T-1P)	On successful completion of the course students will have significant knowledge of acids/bases as well as an overview of bonding in co-ordination compounds, principles of redox chemistry, solutions and their properties. Students will also be able to describe and classify organic compounds in terms of their functional groups and reactivity. Further experiments on acids/bases and redox titrations will enable to consolidate their skills on quantitative analysis. Physical chemistry experiments will introduce the students to physical property measurements and kinetics of chemical reactions.



Internal Quality Assurance Cell

Behali Degree College

P.O.- Borgang, Biswanath, Assam-784167

Email: iqacbehali@gmail.com

DEPARTMENT OF CHEMISTRY **PROGRAMME OUTCOME**

B.Sc. courses

- To develop a strong foundation of theoretical understanding about the all basic branches of chemistry comprising physical, organic, inorganic and analytical chemistry and to apply that fundamental knowledge for advanced learning of chemistry.
- To develop an up to date laboratory skills in qualitative and quantitative analysis to enhance the confidence level of the students in both academic and industrial field.
- To develop critical thinking among the students for solving the various problems related to chemistry in everyday life.
- To develop logical thinking among the students to deal with any problem and result-driven with a positive attitude.
- To develop a habit of working safely in the laboratory in a sustainable and eco-friendly environment.
- To develop a working culture in groups as well as individually to build up a research attitude to tackle with the burning issues at global and local level.

Course Outcome **BSc Chemistry (Honours)**

Semester I	
Paper Code (Subject)	Discussion Topics
CHE-HC-1016 INORGANIC CHEMISTRY-I	This paper is aimed at building the fundamentals of chemistry in the mindset of students with emphasis on atomic structure, periodicity, chemical bonding and oxidation-reduction.
CHE-HC-1016 INORGANIC CHEMISTRY-I LAB	This paper mainly aims on titrimetric analysis, acid-base titrations and oxidation-reduction titrimetry. After completion of this paper, the students would have gained knowledge on theories and practice of estimation of metal ion, carbonate ion, hydroxide ion etc. from the mixture.



Internal Quality Assurance Cell

Behali Degree College

P.O.- Borgang, Biswanath, Assam-784167

Email: iqacbehali@gmail.com

CHE-HC-1026 PHYSICAL CHEMISTRY I	This paper is mainly focused on states of matter- gaseous, liquid and solid states along with ionic equilibria. A small unit of molecular and crystal symmetry is also included in this paper which will be useful to understand solid state chemistry and group theory in some higher courses.
CHE-HC-1026 PHYSICAL CHEMISTRY I LAB	This paper is focused on surface tension measurements by different methods, viscosity measurements of different aqueous solutions using Ostwald's viscometer, indexing of a given powder diffraction pattern of a cubic crystalline system and effect on pH of addition of inorganic acid/base to organic weak acids, preparation of buffer solutions, pH titration, determination of dissociation constant of weak acids.
Semeter-II	
CHE-HC-2016: ORGANIC CHEMISTRY I	The main aim of this paper is to give the knowledge on different classes of organic compounds, their reactivity and their chemical and stereo chemical aspects. This paper comprises of basic of organic chemistry, stereochemistry, chemistry of aliphatic hydrocarbons and aromatic hydrocarbons.
CHE-HC-2016: ORGANIC CHEMISTRY- I LAB	This paper comprises of purification of organic compounds by crystallization, determination of melting points of different organic compounds with different compositions and chromatographic techniques.
CHE-HC-2026: PHYSICAL CHEMISTRY- II	The aim of this course is to teach students about the chemical system from thermodynamic point of view. This paper contains various topic of thermodynamics chemistry including chemical thermodynamics, chemical equilibrium, solutions and colligative properties.
CHE-HC-2026: PHYSICAL CHEMISTRY-II LAB	This paper contains thermochemistry for finding heat capacity, using calorimeter, determination of enthalpy of hydration of copper sulphate and solubility study.
Semester-III	
CHE-HC-3016: INORGANIC CHEMISTRY-II	This paper deals with mainly general principles of metallurgy, concepts of acid-bases, chemistry of s and p block elements, chemistry of noble gases and about inorganic polymers.
CHE-HC-3016: INORGANIC CHEMISTRY-II LAB	This paper contains iodometric titrations and inorganic preparations.
CHE-HC-3026: ORGANIC	This paper comprises of chemistry of halogenated hydrocarbons, alcohols, phenols, esters, epoxides, carbonyl compounds,



Internal Quality Assurance Cell

Behali Degree College

P.O.- Borgang, Biswanath, Assam-784167

Email: iqacbehali@gmail.com

CHEMISTRY-II	carboxylic acids and sulphur containing compounds.
CHE-HC-3026: ORGANIC CHEMISTRY-II LAB	This paper deals with identification of functional groups like alcohols, phenols, carbonyl, carboxylic acid group etc. and organic preparations.
CHE-HC-3036: PHYSICAL CHEMISTRY-III	This paper deals with phase equilibria, chemical kinetics, catalysis and surface chemistry.
CHE-HC-3036: PHYSICAL CHEMISTRY-III LAB	This paper comprises of determination of critical solution temperature and composition of phenol-water system, construction of phase diagram, study of kinetics and adsorption.
Semester-IV	
CHE-HC-4016: INORGANIC CHEMISTRY-III	This paper deals with the study of transition elements, coordination chemistry, bioinorganic chemistry, lanthanoids and actinoids chemistry.
CHE-HC-4016: INORGANIC CHEMISTRY-III LAB	This paper consists of gravimetric analysis, inorganic preparations and chromatography of metal ions.
CHE-HC-4026: ORGANIC CHEMISTRY-III	This paper comprises of the study of compounds with nitrogen containing functional groups, polynuclear hydrocarbons, heterocyclic compounds, alkaloids and terpenes.
CHE-HC-4026: ORGANIC CHEMISTRY-III LAB	This paper deals with the detection of N, S, halogens in organic compounds, functional group test for nitro, ammine, amide groups etc. and analysis of unknown organic compounds with various functional groups.
CHE-HC-4036: PHYSICAL CHEMISTRY-IV	This paper contains conductance study, study of electrochemistry and electrical and magnetic properties study of atoms and molecules.
CHE-HC-4036: PHYSICAL CHEMISTRY-IV LAB	This paper deals with conductometry to determine the cell constant, to perform conductometric titrations and potentiometric titrations of different acids vs. bases with different strengths.



Internal Quality Assurance Cell

Behali Degree College

P.O.- Borgang, Biswanath, Assam-784167

Email: iqacbehali@gmail.com

Course Outcome

BSc Chemistry (Honours/ Regular Generic)

Semester-I	
CHE-RC/HG-1016: CHEMISTRY1	This paper comprises of the concepts of atomic structure, chemical bonding and molecular structure. In the organic chemistry section study about fundamentals of organic chemistry, an introduction to stereochemistry, aliphatic hydrocarbons, alkanes, alkenes and alkynes.
CHE-RC/HG-1016: CHEMISTRY1 LAB	This paper comprises of volumetric analysis with estimation of sodium carbonate and sodium hydrogen carbonate, oxalic acid, Mohr's salt. Fe (II) ions, Cu (II) ions, detection of elements (N, S, Cl, Br, I) in organic compounds and chromatographic separation of mixture of (a) amino acids and (b) sugars.
Semester-II	
CHE-RC/HG-2016: CHEMISTRY2	This paper comprise of two parts-inorganic and physical chemistry. Inorganic chemistry part comprises of s and p block elements, transition elements (3d series), coordination chemistry. Physical chemistry part contains kinetics theory of gases, chemical kinetics, solids and liquids state.
CHE-RC/HG-2016: CHEMISTRY2 LAB	This paper comprises of two parts-inorganic and physical chemistry. Physical chemistry comprises of surface tension measurement, viscosity measurements and chemical kinetics. Inorganic chemistry part comprises of estimation of Mg^{2+} or Zn^{2+} by complexometric titrations using EDTA, estimation of total hardness of a given sample of water by complexometric titration, estimate the amount of nickel present in a given solution as bis(dimethylglyoximate) nickel(II) or aluminium as oximate in a given solution gravimetrically, determination of composition of the Fe^{3+} salicylic acid complex solution by Job's method and determination of concentration of Na^{+} and K^{+} using Flame Photometry.



Internal Quality Assurance Cell

Behali Degree College

P.O.- Borgang, Biswanath, Assam-784167

Email: iqacbehali@gmail.com

Semester-III	
CHE-RC/HG-3016: CHEMISTRY 3	This paper consists of physical chemistry as well as organic chemistry. Physical chemistry comprises of chemical energetic, chemical equilibrium and ionic equilibrium. In the organic chemistry section aromatic hydrocarbons, alkyl halides, aryl halides, alcohols, phenols and ethers are included.
CHE-RC/HG-3016: CHEMISTRY 3 LAB	In this paper, physical chemistry part consists of thermochemistry and ionic equilibria; whereas in the organic chemistry section purification by crystallization, determination of melting and boiling points are included.
Semester-IV	
CHE- RC/HG-4016: CHEMISTRY4	In this paper, physical chemistry section comprises of phase equilibria, conductance and electrochemistry. Organic chemistry section deals with carboxylic acid and their derivatives; amines and diazonium salts; carbohydrates; amino acids, peptides and proteins.
CHE- RC/HG-4016: CHEMISTRY4 LAB	In this paper, physical chemistry section consists of distribution, phase equilibria, conductance and potentiometry. The organic chemistry part includes qualitative organic analysis of organic compounds possessing monofunctional groups, separation of amino acids by paper chromatography, titration curve of glycine etc.

Co-ordinator
IQAC, Behali Degree College
Borgang, Biswanath, Assam

Head
Department of Chemistry
Behali Degree College
Borgang, 784167